

IN THE CLAIMS:

The following is a complete listing of the claims in this application, reflects all changes currently being made to the claims, and replaces all earlier versions and all earlier listings of the claims:

- 61
1. (Currently Amended) A liquid discharge head comprising a heat generating element contacted with and between a pair of electrodes for generating thermal energy which is used for discharging liquid from a discharge port, and a protective ~~coating~~ film provided on said heat generating element to protect said heat generating element,
- wherein said protective ~~coating~~ film has a first region provided between said pair of electrodes, said first region having a substantially uniform thickness along a direction connecting said pair of electrodes, and has a second region provided between said pair of electrodes, said second region having a substantially uniform thickness along the direction,
- wherein said second region is thinner than said first region stepwise ~~and is disposed in all cases closer to said discharge port than said first region~~ and is disposed asymmetrically in a side of said discharge port between said pair of electrodes along the direction,
- wherein the volume of a liquid droplet discharged from said discharge port is changed by changing electric energy applied to said heat generating element, and
- wherein said protective ~~coating~~ film is composed of plural protection layers, said first region having more layers than said second region.

2. and 3. (Canceled)

4. (Currently Amended) A liquid discharge head according to claim 1, wherein said second region is formed by forming an upper protective ~~coating~~ film after etching a lower protective ~~coating~~ film.

5. (Currently Amended) A liquid discharge head according to claim 4, wherein said lower protective ~~coating~~ film is composed of phosphosilicate glass film, said upper protective ~~coating~~ film is composed of SiN film, and said etching is conducted with buffered hydrofluoric acid.

6.-8. (Canceled)

9. (Previously Presented) A liquid discharge head according to claim 1, wherein said heat generating element is composed of material having a positive temperature coefficient.

10. (Previously Presented) A liquid discharge head according to claim 1, wherein said heat generating element is provided in plural numbers, a driving circuit having a plurality of function devices provided for independently driving said plurality of heat generating elements is provided within the substrate on which said heat generating elements is provided.

11. (Currently Amended) A liquid discharge head comprising a heat generating element contacted with and between a pair of electrodes for generating thermal energy which is used for discharging liquid from a discharge port, a protective ~~coating~~ film provided on said heat generating element to protect said heat generating element and a

moving member provided facing said heat generating element and having a free end which is displaced in accordance with generation of a bubble due to said thermal energy,

wherein said protective ~~coating~~ film has a first region provided between said pair of electrodes, said first region having a substantially uniform thickness along a direction connecting said pair of electrodes, and has a second region provided between said pair of electrodes, said second region having a substantially uniform thickness along the direction,

wherein said second region is thinner than said first region stepwise ~~and is disposed in all cases closer to said discharge port than said first region~~ and is disposed asymmetrically in a side of said discharge port between said pair of electrodes along the direction, and

wherein the volume of a liquid droplet discharged from said discharge port is changed by changing electric energy applied to said heat generating element, and

wherein said protective ~~coating~~ film is composed of plural protection layers, said first region having more layers than said second region.

12. and 13. (Canceled)

14. (Currently Amended) A liquid discharge head according to claim 11, wherein said second region is formed by forming the upper protective ~~coating~~ film after etching the lower protective ~~coating~~ film.

15. (Currently Amended) A liquid discharge head according to claim 14, wherein said lower protective ~~coating~~ film is composed of phosphosilicate glass film, said upper protective ~~coating~~ film is composed of SiN film, and said etching is conducted

61
cut
with buffered hydrofluoric acid.

16.-18. (Canceled)

19. (Previously Amended) A liquid discharge head according to claim 11, wherein said heat generating element is composed of polycrystalline silicon.

20. (Previously Amended) A liquid discharge head according to claim 11, wherein said heat generating element is provided in plural numbers, a driving circuit having a plurality of function devices provided for independently driving said plurality of heat generating elements is provided within the substrate on which said heat generating elements is provided.

21. (Previously Amended) A liquid discharge apparatus comprising the liquid discharge head according to claim 1 or 11 and a member for mounting said liquid discharge head.

22. (Currently Amended) A liquid discharge method using a liquid discharge head having a heat generating element contacted with and between a pair of electrodes for generating thermal energy which is used for discharging liquid from a discharge port, and a protective ~~coating~~ film for protecting the heat generating element, provided on the heat generating element, said protective ~~coating~~ film having a first region provided between said pair of electrodes, said first region having a substantially uniform thickness along a direction connecting the pair of electrodes, and having a second region provided between said pair of electrodes, said second region having a substantially uniform

thickness along the direction,

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wherein said second region is thinner than the first region stepwise ~~and is~~
~~disposed in all cases closer to said discharge port than said first region~~ and is disposed
asymmetrically in a side of said discharge port between said pair of electrodes along the
direction,

wherein a size of a bubble generated on the heat generating element is
changed by changing electric energy applied to the heat generating element to generate a
bubble on both the first region and the second region or on only the second region,

wherein the volume of a liquid droplet discharged from the discharge port is
changed, and

wherein said protective ~~coating~~ film is composed of plural protection layers,
said first region having more layers than said second region.

23. (Currently Amended) A liquid discharge method using a liquid
discharge head having a heat generating element contacted with and between a pair of
electrodes for generating thermal energy which is used for discharging liquid from a
discharge port, a protective ~~coating~~ film for protecting the heat generating element,
provided on the heat generating element and a moving member provided facing the heat
generating element and having a free end which is displaced in accordance with generation
of a bubble due to the thermal energy, the protective ~~coating~~ film having a first region
provided between said pair of electrodes, said first region having a substantially uniform
thickness along a direction connecting the pair of electrodes, and having a second region
provided between said pair of electrodes, said second region having a substantially uniform
thickness along the direction,

wherein said second region is thinner than the first region stepwise ~~and is~~

61
cont

~~disposed in all cases closer to said discharge port than said first region~~ and is disposed
asymmetrically in a side of said discharge port between said pair of electrodes along the
direction,

wherein a size of a bubble generated on the heat generating element is
changed by changing electric energy applied to the heat generating element to generate a
bubble on both the first region and the second region or on only the second region, ~~and~~

wherein the volume of a liquid droplet discharged from the discharge port is
changed, and

wherein said protective ~~coating~~ film is composed of plural protection layers,
said first region having more layers than said second region.
